KRAMER ELECTRONICS LTD.

USER MANUAL

MODELS:

VA-1USB-T
USB Transmitter

VA-1USB-R
USB Receiver

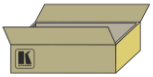
P/N: 2900-300209 Rev 3

VA-1USB-T, VA-1USB-R USB Transmitter/Receiver Quick Start Guide

This guide helps you install and use your product for the first time. For more detailed information, go to http://www.kramerelectronics.com/support/product_downloads.asp to download the latest manual or scan the QR code on the left.

Step 1: Check what's in the box

- **VA-1USB-T** USB Transmitter and **VA-1USB-R** Receiver
- 2 Power adapters (5V DC)
- 8 Rubber feet
- 1 Quick start guide
- 1 IR Blaster Cable



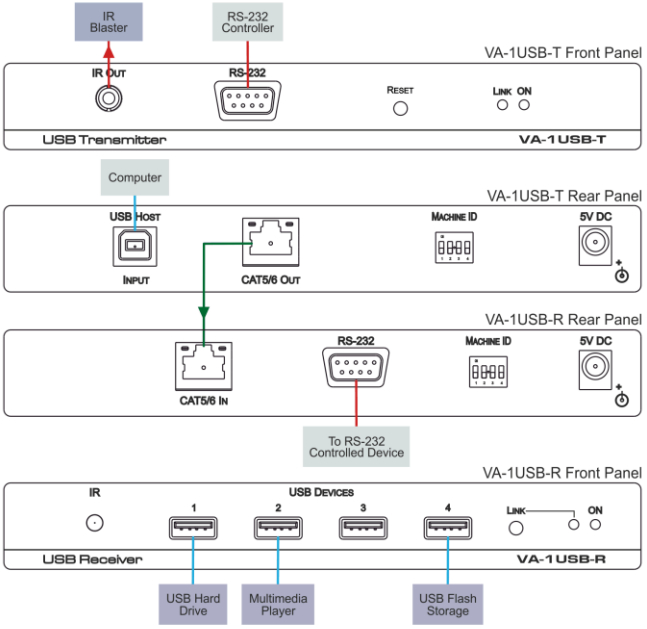
Save the original box and packaging materials in case your Kramer product needs to be returned to the factory for service.

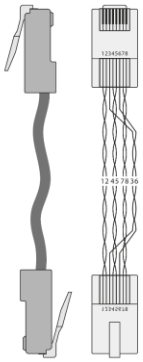
Step 2: Install the VA-1USB-T and VA-1USB-R

Mount the devices in racks (using the optional **RK-T2B** rack adapter available for purchase) or attach the rubber feet and place them on shelves.

Step 3: Connect the inputs and outputs

Always switch off the power to all devices before connecting them to your **VA-1USB-T** and **VA-1USB-R**.





Twisted Pair Pinout

EIA / TIA 568B	
PIN	Wire Color
1	Orange / White
2	Orange
3	Green / White
4	Blue
5	Blue / White
6	Green
7	Brown / White
8	Brown

For best results we recommend the use of shielded twisted pair (STP) non-skew-free Kramer **BC-STP** cable for digital signals.

Step 4: Connect the power

Connect the power adapters to the **VA-1USB-T** and **VA-1USB-R** and plug the adapters into the mains electricity.

Contents

1	**Introduction**	**1**
2	**Getting Started**	**2**
2.1	Achieving the Best Performance	2
2.2	Safety Instructions	3
2.3	Recycling Kramer Products	3
2.4	Shielded Twisted Pair/Unshielded Twisted Pair	3
3	**Overview**	**4**
4	**Defining the VA-1USB-T and VA-1USB-R USB Transmitter and Receiver**	**5**
4.1	Defining the VA-1USB-T USB Transmitter	5
4.2	Defining the VA-1USB-R USB Receiver	6
5	**Connecting the VA-1USB-T and VA-1USB-R**	**8**
5.1	Connecting to the product via RS-232	10
5.2	Setting the Device ID DIP-switch	10
5.3	Resetting the VA-1USB-T to Factory Default Settings	11
5.4	Resetting the VA-1USB-R to Factory Default Settings	11
6	**Using the Web Pages**	**12**
6.1	Accessing the VA-1USB-T/VA-1USB-R Embedded Web Pages	12
6.2	The System Tab	13
6.3	The Network Tab	15
6.4	The Functions Tab	16
7	**Wiring the Twisted Pair RJ-45 Connectors**	**18**
8	**Technical Specifications**	**19**
9	**Default Communication Parameters**	**20**

Figures

Figure 1: VA-1USB-T USB Transmitter Front Panel 5
Figure 2: VA-1USB-T USB Transmitter Rear Panel 6
Figure 3: VA-1USB-R USB Receiver Front Panel 7
Figure 4: VA-1USB-R USB Receiver Rear Panel 7
Figure 5: Connecting the VA-1USB-T Transmitter and VA-1USB-R Receiver 8
Figure 6: Machine ID DIP-switch 10
Figure 7: Entering the IP Address in your Browser 12
Figure 8: Main Page System Tab 12
Figure 9: System Tab 13
Figure 10: Update Firmware Window 14
Figure 11: Warning Message 15
Figure 12: The Network Tab 15
Figure 13: Warning Message 15
Figure 14: The Functions Tab 16
Figure 15: Warning Message 17
Figure 16: TP Pinout Wiring 18

1 Introduction

Welcome to Kramer Electronics! Since 1981, Kramer Electronics has been providing a world of unique, creative, and affordable solutions to the vast range of problems that confront video, audio, presentation, and broadcasting professionals on a daily basis. In recent years, we have redesigned and upgraded most of our line, making the best even better!

Our 1,000-plus different models now appear in 11 groups that are clearly defined by function: GROUP 1: Distribution Amplifiers; GROUP 2: Switchers and Routers; GROUP 3: Control Systems; GROUP 4: Format/Standards Converters; GROUP 5: Range Extenders and Repeaters; GROUP 6: Specialty AV Products; GROUP 7: Scan Converters and Scalers; GROUP 8: Cables and Connectors; GROUP 9: Room Connectivity; GROUP 10: Accessories and Rack Adapters and GROUP 11: Sierra Video Products.

Thank you for purchasing the Kramer MegaTOOLS® **VA-1USB-T** *USB Transmitter* and **VA-1USB-R** *USB Receiver* which are ideal for:

- Presentation and multimedia applications
- Long range USB distribution for schools, hospitals, stores and security installations

Each package includes the following items:

- **VA-1USB-T** *USB Transmitter* and **VA-1USB-R** *USB Receiver*
- 2 Power adapters (5V DC)
- IR Blaster cable
- This user manual

2 Getting Started

We recommend that you:

- Unpack the equipment carefully and save the original box and packaging materials for possible future shipment
- Review the contents of this user manual

Go to http://www.kramerelectronics.com/support/product_downloads.asp to check for up-to-date user manuals, application programs, and to check if firmware upgrades are available (where appropriate).

2.1 Achieving the Best Performance

To achieve the best performance:

- Use only good quality connection cables (we recommend Kramer high-performance, high-resolution cables) to avoid interference, deterioration in signal quality due to poor matching, and elevated noise levels (often associated with low quality cables)
- Do not secure the cables in tight bundles or roll the slack into tight coils
- Avoid interference from neighboring electrical appliances that may adversely influence signal quality
- Position your Kramer **VA-1USB-T** and **VA-1USB-R** away from moisture, excessive sunlight and dust

This equipment is to be used only inside a building. It may be connected only to other equipment that is installed inside a building

2.2 Safety Instructions

Caution: No operator serviceable parts inside the unit

Warning: Use only the Kramer Electronics input power wall adapter that is provided with the unit

Warning: Disconnect the power and unplug the unit from the wall before installing

2.3 Recycling Kramer Products

The Waste Electrical and Electronic Equipment (WEEE) Directive 2002/96/EC aims to reduce the amount of WEEE sent for disposal to landfill or incineration by requiring it to be collected and recycled. To comply with the WEEE Directive, Kramer Electronics has made arrangements with the European Advanced Recycling Network (EARN) and will cover any costs of treatment, recycling and recovery of waste Kramer Electronics branded equipment on arrival at the EARN facility. For details of Kramer's recycling arrangements in your particular country go to our recycling pages at *http://www.kramerelectronics.com/support/recycling/*.

2.4 Shielded Twisted Pair/Unshielded Twisted Pair

We recommend that you use Shielded Twisted Pair (STP) cable and stress that the compliance to electromagnetic interference was tested using STP cable. There are different levels of STP cable available and we advise you to use the best quality STP cable that you can afford.

For the **VA-1USB-T** and **VA-1USB-R** pair we recommend the use of shielded, twisted pair (STP), non-skew-free Kramer **BC-STP** cable.

3 Overview

The **VA-1USB-T** and **VA-1USB-R** are a high-performance, TP (Twisted Pair) transmitter and receiver for communicating USB, bidirectional RS-232 data and unidirectional IR signals over extended distances using CAT 5/6 cable.

The **VA-1USB-T** encodes USB signals and RS-232 data and transmits them over CAT 5/6 cable as a TP signal. The **VA-1USB-R** decodes the signal from the TP into USB signals and RS-232 data. The **VA-1USB-R** also acts as a 4-port USB hub and receives IR signals for transmission back to the **VA-1USB-T**.

More specifically, the **VA-1USB-T** and **VA-1USB-R** support:

- USB 2.0 high speed and USB 1.1 signals (bulk mode, not isochronous)
- True Plug and Play operation without drivers
- All major operating systems
- Full duplex, bidirectional RS-232 transmission
- Local and remote control of devices via the serial port
- Operation up to 100m (328ft) apart
- Web pages for maintenance and configuration
- Automatic Ethernet speed selection
- Up to 16 independent pairs of devices on a single network

4 Defining the VA-1USB-T and VA-1USB-R USB Transmitter and Receiver

This section defines the:

- **VA-1USB-T** *USB Transmitter* (see Section 4.1)
- **VA-1USB-R** *USB Receiver* (see Section 4.2)

4.1 Defining the VA-1USB-T USB Transmitter

In addition to encoding and transmitting the USB and RS-232 signals, the **VA-1USB-T** outputs the IR signal received from the **VA-1USB-R**.

RS-232 commands and data flow bidirectionally allowing status requests and control of a destination unit.

Figure 1 defines the front panel of the **VA-1USB-T.**

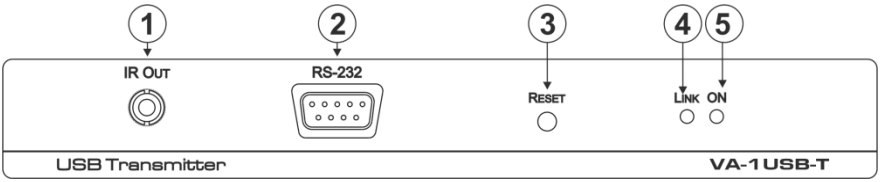


Figure 1: VA-1USB-T USB Transmitter Front Panel

#	Feature	Function
1	*IR OUT* 3.5mm Mini Jack	Connect the IR blaster
2	*RS-232* 9-pin D-sub Serial Port Connector (F)	Connect to the serial controller **Note**: The RS-232 link is bidirectional
3	*RESET* Button	Press to reset the device to factory default (see Section 5.3)
4	*LINK* LED	Lights green when the TP link to the receiver is established
5	*ON* LED	Lights green when the device is powered on

Figure 2 defines the rear panel of the **VA-1USB-T.**

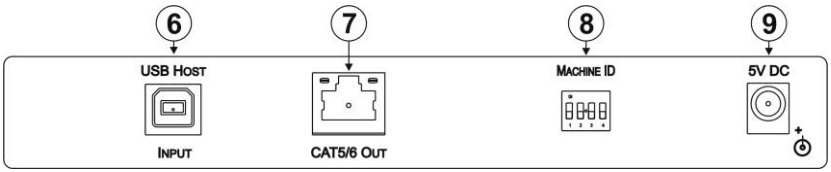


Figure 2: VA-1USB-T USB Transmitter Rear Panel

#	Feature	Function
6	*USB HOST INPUT* Type B USB Connector	Connect to a USB host (see Section 5)
7	*CAT 5/6 OUT* RJ-45 Connector	Connect to the CAT 5/6 IN RJ-45 connector on the VA-1USB-R (see Section 2.4)
8	*MACHINE ID* 4-way DIP-switch	Use to set the device ID to pair with the receiver (see Section 5.2)
9	*5V DC* Power Connector	Connect to one of the supplied +5V DC power adapters. Center pin positive

4.2 Defining the VA-1USB-R USB Receiver

The **VA-1USB-R** decodes the USB signal and RS-232 data from the TP link sent from the **VA-1USB-T**. The receiver distributes the USB signal across four USB ports (acting as a USB hub) and outputs the RS-232 data. The **VA-1USB-R** receives an IR signal via its IR sensor and sends it over the TP link to the **VA-1USB-T**.

Figure 3 defines the front panel of the **VA-1USB-R**.

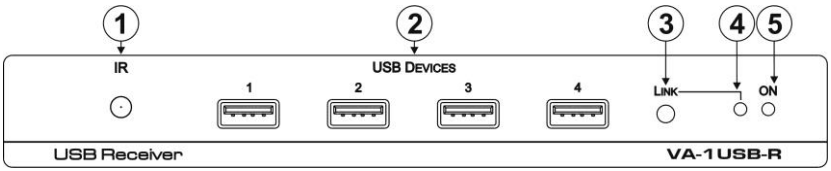


Figure 3: VA-1USB-R USB Receiver Front Panel

#	Feature		Function
1	*IR* Sensor		Receives IR signals from an IR transmitter
2	*USB DEVICES 1~4* Type A USB Connectors		Connect to up to four USB devices
3	*LINK*	Button	Press to establish the TP link to the transmitter
4		LED	Lights green when the TP link to the transmitter is established
5	*ON* LED		Lights green to indicate that the device is powered on

Figure 4 defines the rear panel of the **VA-1USB-R**.

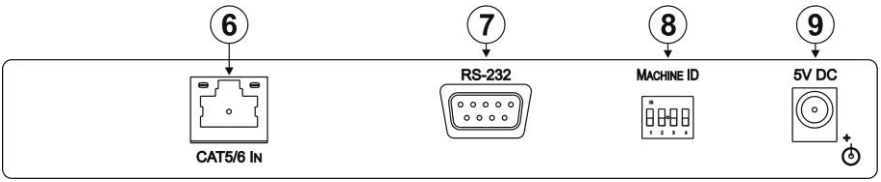


Figure 4: VA-1USB-R USB Receiver Rear Panel

#	Feature	Function
6	*CAT 5/6 IN* RJ-45 Connector	Connect to the CAT 5/6 OUT RJ-45 connector on the rear panel of the VA-1USB-T (see Section 2.4)
7	*RS-232* 9-pin D-sub Serial Port Connector (F)	Connect to the device to be controlled via the serial link. **Note**: The RS-232 link is bidirectional
8	*MACHINE ID* 4-way DIP-switch	Use to set the device ID to pair with the transmitter (see Section 5.2)
9	*5V DC* Power Connector	Connect to one of the supplied +5V DC power adapters. Center pin positive

5 Connecting the VA-1USB-T and VA-1USB-R

Switch off the power to all devices before connecting them to your **VA-1USB-T/VA-1USB-R**. After connecting your **VA-1USB-T/ VA-1USB-R**, connect the power to the transmitter and receiver and then switch on the power to the other devices.

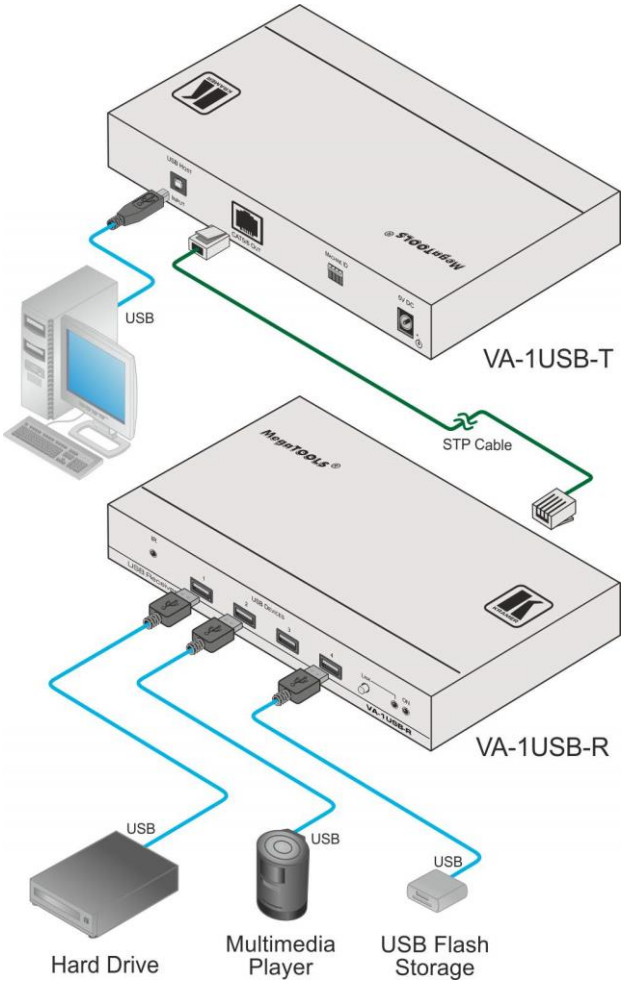


Figure 5: Connecting the VA-1USB-T Transmitter and VA-1USB-R Receiver

To connect the VA-1USB-T and the VA-1USB-R as illustrated in the example in Figure 5:

1. On the **VA-1USB-T**, connect:
   - The USB host, (for example, a computer) to the USB Host Input connector
   - The RS-232 controller, (for example, a laptop controller with an RS-232 interface) to the RS-232 9-pin D-sub connector
   - An IR blaster to the IR 3.5mm mini jack
2. On the **VA-1USB-R**, connect:
   - The first USB Devices port to a USB hard drive
   - The second USB Devices port to a multimedia player
   - The fourth USB Devices port to a USB flash storage device
3. Using STP cabling, connect the CAT 5/6 Out RJ-45 connector on the **VA-1USB-T** to the CAT 5/6 In RJ-45 connector on the **VA-1USB-R** (see Section 2.4).
4. Set the machine ID on both devices to the same ID using the Machine ID DIP-switch (see Section 5.2).
5. Connect the power adapters to the power sockets on the **VA-1USB-T** and **VA-1USB-R**, and plug the adapters into the mains electricity (not shown in Figure 5).
6. Establish a TP link by pressing the Link button on the receiver.

5.1 Connecting to the product via RS-232

You can connect to the **VA-1USB-T/VA-1USB-R** via an RS-232 connection using, for example, a PC. Note that a null-modem adapter/connection is not required.

To connect to the **VA-1USB-T/VA-1USB-R** via RS-232:

- Connect the RS-232 9-pin D-sub port on the **VA-1USB-T/VA-1USB-R** via a 9-wire, straight cable (only pin 2 to pin 2, pin 3 to pin 3, and pin 5 to pin 5 need to be connected) to the RS-232 9-pin D-sub port on your PC

5.2 Setting the Device ID DIP-switch

The Device ID DIP-switch is used on both the **VA-1USB-T** transmitter and **VA-1USB-R** receiver to set matching device numbers. This allows up to 16 pairs of transmitters and receivers to communicate independently on the same TP subnet.

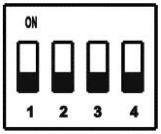


Figure 6: Machine ID DIP-switch

Set each device in a transmitter and receiver pair to the same device ID according to the following table. Press a switch up to turn it on and down to turn it off.

Device ID	Switch Number			
	1	2	3	4
0 (default)	Off	Off	Off	Off
1	Off	Off	Off	On
2	Off	Off	On	Off
3	Off	Off	On	On
4	Off	On	Off	Off
5	Off	On	Off	On
6	Off	On	On	Off
7	Off	On	On	On
8	On	Off	Off	Off
9	On	Off	Off	On

Device ID	Switch Number			
	1	2	3	4
10	On	Off	On	Off
11	On	Off	On	On
12	On	On	Off	Off
13	On	On	Off	On
14	On	On	On	Off
15	On	On	On	On

5.3 Resetting the VA-1USB-T to Factory Default Settings

To reset the **VA-1USB-T** to factory default settings:

1. Turn off the power to the device.
2. Press and hold the Reset button while turning on the power to the device.
3. When the Link LED starts to flash, release the Reset button.
   The device is reset to factory default settings.

5.4 Resetting the VA-1USB-R to Factory Default Settings

To reset the **VA-1USB-R** to factory default settings:

1. Turn off the power to the device.
2. Press and hold the Link button while turning on the power to the device.
3. When the Link LED starts to flash, release the Link button.
   The device is reset to factory default settings.

6 Using the Web Pages

The **VA-1USB-T** and **VA-1USB-R** provide built-in Web pages accessible by standard Web browsers that allow you to configure and maintain the devices.

6.1 Accessing the VA-1USB-T/VA-1USB-R Embedded Web Pages

Before you can use the embedded Web pages, check that your computer is correctly connected to the **VA-1USB-T**/**VA-1USB-R** via the Ethernet connection.

To access the VA-1USB-T/VA-1USB-R embedded Web pages:

1. Open your Internet browser.
2. Type the IP address (see Section 9) of the **VA-1USB-T**/**VA-1USB-R** in the address bar of your browser. (The IP address for the **VA-1USB-T** is shown, for the IP address of the **VA-1USB-R** see Section 8).

Figure 7: Entering the IP Address in your Browser

The screen shown in Figure 8 appears.

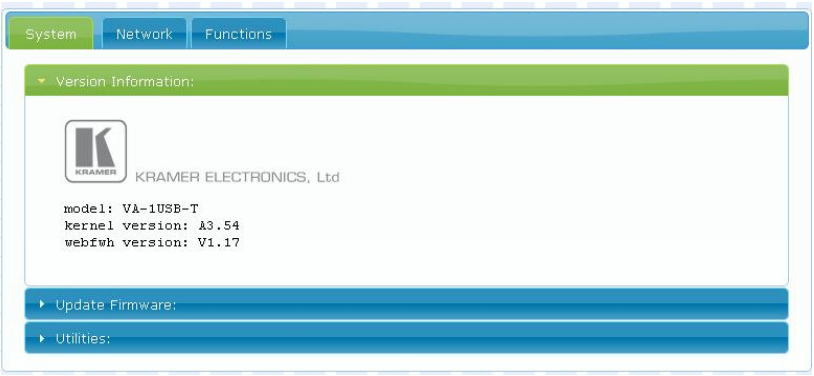


Figure 8: Main Page System Tab

The Web pages consist of the following tabs:

- System tab (see Section 6.2)
- Network tab (see Section 6.3)
- Functions tab (see Section 6.4)

6.2 The System Tab

Using the **System** tab (Figure 9) you can:

- View the version information
- Update the firmware
- Run functions

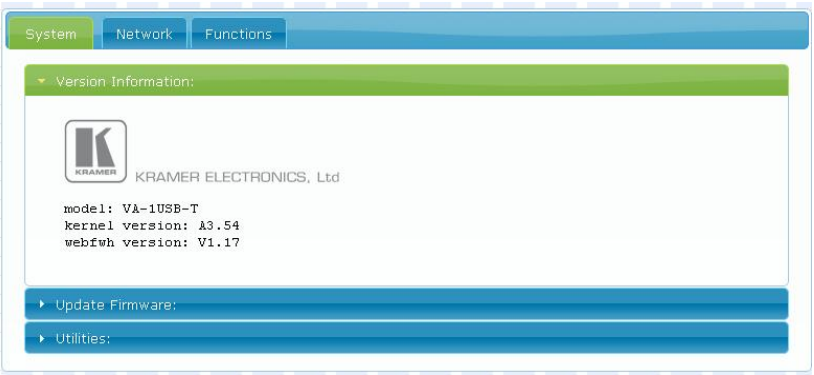


Figure 9: System Tab

To update the firmware:

1. Click on Update Firmware.
   The window shown in Figure 10 is displayed.

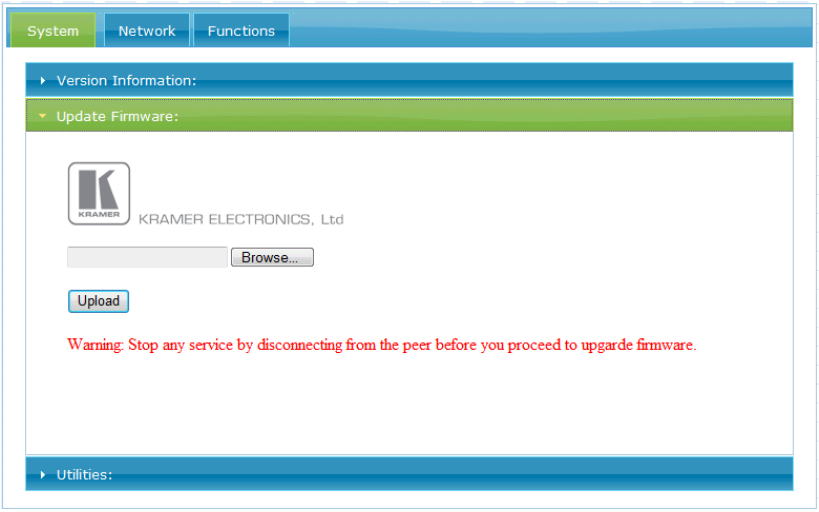


Figure 10: Update Firmware Window

2. Click on Browse.
   The Windows Browser is displayed.

3. Browse to the new firmware file location.

4. Select the new firmware file.

5. Click OK.
   The name of the new firmware file is displayed in the Update Firmware window.

6. Click on Upload.
   The update starts.

Warning: Do not turn off or in any way interrupt the update process as this may cause the device to become inoperable.

7. When the process is complete, reboot the device (as indicated by the message shown in Figure 11) by clicking on Utilities and clicking Reboot.
   The device is rebooted with the new firmware.

Figure 11: Warning Message

6.3 The Network Tab

Using the **Network** tab (Figure 12), you can modify the IP parameters of the device. Currently only static IP addressing is allowed.

Figure 12: The Network Tab

To change the IP parameters:

1. Click on the Network tab.
   The window shown in Figure 12 is displayed.

2. Modify the IP address, subnet mask and default gateway addresses as required.

3. Click Apply.
   The changes are made and the message shown in Figure 13 is displayed.

Figure 13: Warning Message

4. Reboot the device by clicking on Utilities and clicking Reboot.
   The device is rebooted with the new IP parameters.

6.4 The Functions Tab

Using the **Functions** tab (Figure 14) you can enable/disable and modify the serial-over-IP parameters.

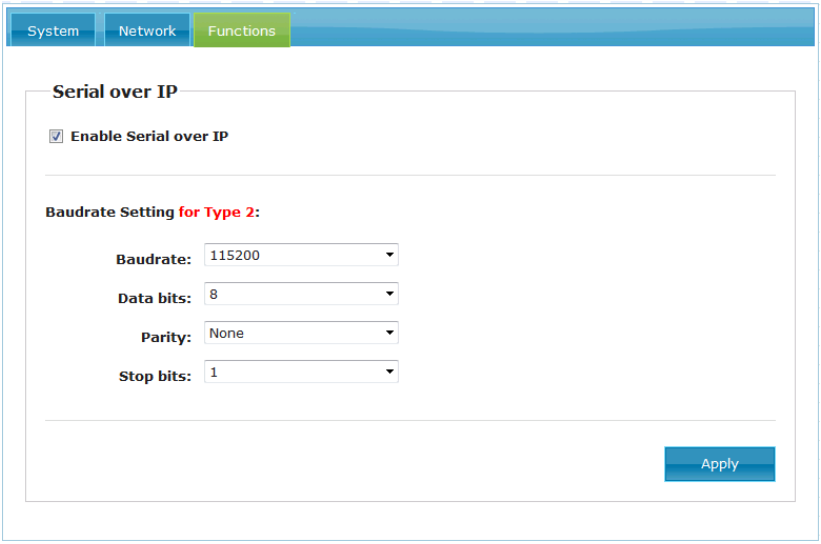


Figure 14: The Functions Tab

To modify the serial-over-IP functionality:

1. Click on the Functions tab.
   The window shown in Figure 14 is displayed.

2. Enable or disable the device by checking or unchecking the Enable Serial over IP box.

3. Modify the serial communication parameters using the drop-down lists for Baud rate, Data bits, Parity and Stop bits.

4. Click Apply.
   The changes are made and the message shown in Figure 15 is displayed.

Figure 15: Warning Message

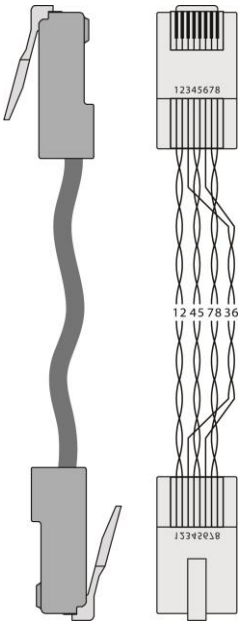
5. Reboot the device by clicking on Utilities and clicking Reboot.
   The device is rebooted with the new IP parameters.

7 Wiring the Twisted Pair RJ-45 Connectors

When using STP cable, connect/solder the cable shield to the RJ-45 connector shield. Figure 16 defines the TP pinout using a straight pin-to-pin cable with RJ-45 connectors.

EIA /TIA 568B	
PIN	**Wire Color**
1	Orange / White
2	Orange
3	Green / White
4	Blue
5	Blue / White
6	Green
7	Brown / White
8	Brown
Pair 1	4 and 5
Pair 2	1 and 2
Pair 3	3 and 6

Figure 16: TP Pinout Wiring



8 Technical Specifications

		VA-1USB-T	VA-1USB-R
INPUTS:		1 USB host on a USB Type B connector 1 Bidirectional RS-232 serial port on a 9-pin D-sub connector (F)	1 TP CAT 5/6 IN on an RJ-45 connector 1 IR sensor
OUTPUTS:		1 TP CAT 5/6 OUT on an RJ-45 connector 1 Unidirectional IR port on a 3.5mm mini jack	4 USB devices on USB Type A connectors 1 Bidirectional RS-232 serial port on a 9-pin D-sub connector (F)
USB SUPPORT:		1.1 and 2.0 (bulk mode, not isochronous)	
ETHERNET SPEED:		100/1000Mbps automatic selection	
RS-232:	BAUD RATE:	Up to 115200bps	
	MODE:	Full-duplex	
POWER CONSUMPTION:		5V DC 800mA	5V DC 2.8A
MAXIMUM POWER OUTPUT:			5V 500mA per USB port
TRANSMISSION DISTANCE:		Up to 100m (328ft)	
OPERATING TEMPERATURE:		0° to +40°C (32° to 104°F)	
STORAGE TEMPERATURE:		–40° to +70°C (–40° to 158°F)	
HUMIDITY:		10% to 90%, RHL non-condensing	
DIMENSIONS:		12.1cm x 7.18cm x 2.42cm (4.76" x 2.83" x 0.95"), W, D, H	
WEIGHT:		0.44kg (0.97lbs.) approx. each	
INCLUDED ACCESSORIES:		2 Power supplies	
OPTIONS:		RK-T2B 19” rack adapter	

9 Default Communication Parameters

RS-232	VA-1USB-T	VA-1USB-R
Baud Rate:	115200	
Data Bits:	8	
Stop Bits:	1	
Parity:	None	
Ethernet		
IP Address:	192.168.1.39	192.168.1.40
Network Mask:	255.255.255.0	
Default Gateway:	192.168.1.1	

LIMITED WARRANTY

The warranty obligations of Kramer Electronics for this product are limited to the terms set forth below:

What is Covered

This limited warranty covers defects in materials and workmanship in this product.

What is Not Covered

This limited warranty does not cover any damage, deterioration or malfunction resulting from any alteration, modification, improper or unreasonable use or maintenance, misuse, abuse, accident, neglect, exposure to excess moisture, fire, improper packing and shipping (such claims must be presented to the carrier), lightning, power surges, or other acts of nature. This limited warranty does not cover any damage, deterioration or malfunction resulting from the installation or removal of this product from any installation, any unauthorized tampering with this product, any repairs attempted by anyone unauthorized by Kramer Electronics to make such repairs, or any other cause which does not relate directly to a defect in materials and/or workmanship of this product. This limited warranty does not cover cartons, equipment enclosures, cables or accessories used in conjunction with this product.

Without limiting any other exclusion herein, Kramer Electronics does not warrant that the product covered hereby, including, without limitation, the technology and/or integrated circuit(s) included in the product, will not become obsolete or that such items are or will remain compatible with any other product or technology with which the product may be used.

How Long Does this Coverage Last

Seven years as of this printing; please check our Web site for the most current and accurate warranty information.

Who is Covered

Only the original purchaser of this product is covered under this limited warranty. This limited warranty is not transferable to subsequent purchasers or owners of this product.

What Kramer Electronics will do

Kramer Electronics will, at its sole option, provide one of the following three remedies to whatever extent it shall deem necessary to satisfy a proper claim under this limited warranty:

1. Elect to repair or facilitate the repair of any defective parts within a reasonable period of time, free of any charge for the necessary parts and labor to complete the repair and restore this product to its proper operating condition. Kramer Electronics will also pay the shipping costs necessary to return this product once the repair is complete.
2. Replace this product with a direct replacement or with a similar product deemed by Kramer Electronics to perform substantially the same function as the original product.
3. Issue a refund of the original purchase price less depreciation to be determined based on the age of the product at the time remedy is sought under this limited warranty.

What Kramer Electronics will not do Under This Limited Warranty

If this product is returned to Kramer Electronics or the authorized dealer from which it was purchased or any other party authorized to repair Kramer Electronics products, this product must be insured during shipment, with the insurance and shipping charges prepaid by you. If this product is returned uninsured, you assume all risks of loss or damage during shipment. Kramer Electronics will not be responsible for any costs related to the removal or re-installation of this product from or into any installation. Kramer Electronics will not be responsible for any costs related to any setting up this product, any adjustment of user controls or any programming required for a specific installation of this product.

How to Obtain a Remedy under this Limited Warranty

To obtain a remedy under this limited warranty, you must contact either the authorized Kramer Electronics reseller from whom you purchased this product or the Kramer Electronics office nearest you. For a list of authorized Kramer Electronics resellers and/or Kramer Electronics authorized service providers, please visit our web site at www.kramerelectronics.com or contact the Kramer Electronics office nearest you.

In order to pursue any remedy under this limited warranty, you must possess an original, dated receipt as proof of purchase from an authorized Kramer Electronics reseller. If this product is returned under this limited warranty, a return authorization number, obtained from Kramer Electronics, will be required. You may also be directed to an authorized reseller or a person authorized by Kramer Electronics to repair the product.

If it is decided that this product should be returned directly to Kramer Electronics, this product should be properly packed, preferably in the original carton, for shipping. Cartons not bearing a return authorization number will be refused.

Limitation on Liability

THE MAXIMUM LIABILITY OF KRAMER ELECTRONICS UNDER THIS LIMITED WARRANTY SHALL NOT EXCEED THE ACTUAL PURCHASE PRICE PAID FOR THE PRODUCT. TO THE MAXIMUM EXTENT PERMITTED BY LAW, KRAMER ELECTRONICS IS NOT RESPONSIBLE FOR DIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM ANY BREACH OF WARRANTY OR CONDITION, OR UNDER ANY OTHER LEGAL THEORY. Some countries, districts or states do not allow the exclusion or limitation of relief, special, incidental, consequential or indirect damages, or the limitation of liability to specified amounts, so the above limitations or exclusions may not apply to you.

Exclusive Remedy

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IF ANY PRODUCT TO WHICH THIS LIMITED WARRANTY APPLIES IS A “CONSUMER PRODUCT” UNDER THE MAGNUSON-MOSS WARRANTY ACT (15 U.S.C.A. §2301, ET SEQ.) OR OTHER APPICABLE LAW, THE FOREGOING DISCLAIMER OF IMPLIED WARRANTIES SHALL NOT APPLY TO YOU, AND ALL IMPLIED WARRANTIES ON THIS PRODUCT, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR THE PARTICULAR PURPOSE, SHALL APPLY AS PROVIDED UNDER APPLICABLE LAW.

Other Conditions

This limited warranty gives you specific legal rights, and you may have other rights which vary from country to country or state to state.

This limited warranty is void if (i) the label bearing the serial number of this product has been removed or defaced, (ii) the product is not distributed by Kramer Electronics or (iii) this product is not purchased from an authorized Kramer Electronics reseller. If you are unsure whether a reseller is an authorized Kramer Electronics reseller, please visit our Web site at www.kramerelectronics.com or contact a Kramer Electronics office from the list at the end of this document.

Your rights under this limited warranty are not diminished if you do not complete and return the product registration form or complete and submit the online product registration form. Kramer Electronics thanks you for purchasing a Kramer Electronics product. We hope it will give you years of satisfaction.

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We welcome your questions, comments, and feedback.
Web site: www.kramerelectronics.com
E-mail: info@kramerel.com

SAFETY WARNING
Disconnect the unit from the power supply before opening and servicing

P/N: 2900-300209 Rev: 3